

October 28, 1999

Colonel Allan B. Carroll
District Engineer
Norfolk District, Corps of Engineers
Fort Norfolk, 803 Front Street
Norfolk, Virginia 23510-1096

Attn: Ms. Alice Allen-Grimes

Re: Route 665 Bridge Replacement, Scott
County, Virginia
VDOT Project # 0665-084-6089,
SR01, Norfolk District Permit
Application # 98-4170

Dear Colonel Carroll:

The U.S. Fish and Wildlife Service has reviewed project plans for the Virginia Department of Transportation (VDOT) project number 0665-084-6089, SR01. VDOT proposes to replace the existing bridge on Route 665 over Copper Creek, Scott County, Virginia. Your April 13, 1999 request for formal consultation was received by the Service on April 16, 1999. This document represents the Service's biological opinion on the effects of that action on the federally listed endangered purple bean (*Villosa perpurpurea*) and duskytail darter (*Etheostoma percnurum*), the federally listed threatened yellowfin madtom (*Noturus flavipinnis*), and federally designated critical habitat for the yellowfin madtom, in accordance with Section 7 of the Endangered Species Act of 1973, as amended, (16 U.S.C. 1531 et seq.). A complete administrative record of this consultation is on file in this office.

I. CONSULTATION HISTORY

6-98 Final report submitted to VDOT by Braven Beaty of Virginia Polytechnic and State University, on the survey of the freshwater mussel fauna at the proposed project location.

- 12-1-98 VDOT presents project at the interagency coordination meeting.
- 12-1-98 Service recommends formal Section 7 consultation at VDOT's monthly interagency coordination meeting.
- 3-8-99 VDOT letter recommending that the Corps request formal consultation of the Service.
- 3-30-99 Interagency site visit at proposed project location.
- 4-16-99 Service receives request from Corps of Engineers, dated April 13, 1999, to initiate formal consultation.
- 4-23-99 Letter from Service to the Corps acknowledging that the Corps' April 13, 1999 letter requesting initiation of formal consultation was complete.

II. BIOLOGICAL OPINION

DESCRIPTION OF PROPOSED ACTION

VDOT has applied for a Department of the Army permit to replace the existing State Route 665 2-lane bridge over Copper Creek in Scott County, Virginia (Figures 1, 3, & 4) at approximately river mile 7.6 (river kilometer 12.3). VDOT proposes to replace the existing bridge with a new 2-lane bridge located approximately 70 feet upstream. Construction is scheduled to begin in March 2000 with an estimated completion date of the summer of 2001.

The existing bridge is 150 feet long with two, 75 foot spans and one instream pier. The proposed bridge will consist of 3 spans (63' long, 84' long, and 64.6' long) with 1 instream pier (32 feet by 8 feet). A temporary workbridge will consist of temporary fill of approximately 260 square feet below ordinary high water. The only other fill below ordinary high water will consist of temporary fill for cofferdam construction.

The work at the site will involve the following steps and timeline:

- 1) mobilization, placing traffic signs, placing erosion and sediment control structures, performing clearing and grubbing, and placing the access road for the temporary workbridge (within approximately one month from the start of construction);
- 2) construction of a rock-filled, timber crib below ordinary high water to serve as support for the temporary workbridge (within approximately two months from the start of construction);

- 3) completing the workbridge and placing a non-erodible cofferdam around the site of proposed Pier 2 (within approximately three months);
- 4) excavating down to bedrock and forming and pouring concrete in sections to complete Pier 2 and removing the cofferdam (within approximately five months);
- 5) placing cofferdams around the sites of proposed Abutment A and pier 1 (within approximately six months);
- 6) cofferdam removal at Abutment A and Pier 1 (within approximately six and one-half months) [Note: Steps 5 and 6 may be completed before, concurrent with, or after steps 1 through 4];
- 7) completing the decking of the new bridge and removing the decking of the old bridge (within approximately 12 months);
- 8) removing the concrete arch beams in a minimum of six-foot sections by crane to minimize the amount of debris entering the stream (within approximately 13 months);
- 9) placing a non-erodible cofferdam around the pier of the old bridge (within approximately 13-½ months);
- 10) removing the pier of the old bridge at or below the streambed elevation and removing the associated cofferdam (within approximately 14-½ months);
- 11) removing the workbridge and the access ramp (within approximately 15 months);
- 12) removing both abutments of the old bridge (within approximately 16 months);
- 13) finalizing the project within 18 months.

VDOT will implement and maintain strict erosion and sediment control measures, including the use of silt fencing, non-erodible cofferdams, and sediment control basins during all phases of construction. VDOT proposes to prohibit all instream construction during the time periods of spawning and glochidial release by the purple bean (August 15 through September 30 and April 15 through June 15 of any year, respectively) and during the time periods of spawning by the yellowfin madtom and duskytail darter (April 1 through July 31 of any year). In addition, VDOT will prohibit all instream work during the time period of spawning by the State threatened longhead darter (*Percina macrocephala*) (March 1 through May 15) of any year.

All existing bridge materials, as well as any temporary construction access materials, will be salvaged or used within the new roadway prism in order to prevent entry of these materials into streams and/or wetlands either on- or off-site.

Action Area - The action area is defined as all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action. The Service has determined that the action area for this project consists of that portion of Copper Creek between 100 meters upstream of the existing bridge and 800 meters downstream of this bridge. The 100-meter upstream portion of the action area extends to the mill dam plunge pool. On the northern and southern shore of Copper Creek, the action area consists of a riparian corridor 100 meters in width, located 200 meters upstream and 100 meters downstream of the existing bridge (Figure 2). The northern shoreline consists of grassy vegetation and the existing roadways. The southern shoreline is vegetated by trees and the existing roadways.

The action area is located at river mile 7.6 (rkm 12.3) on Copper Creek and lies immediately downstream of an old mill dam. During a recent mussel survey of the action area, the width of the stream in the action area ranged from 17-25 meters, the maximum depth is 0.9 m, and the mean depth is approximately 0.6 m. The substratum throughout the reach was dominated by intermittent sections of bedrock and cobble. Approximately half of the substratum of this reach was bedrock. The cobble substrata was mixed with either sand and pebble or sand and gravel. The cobble/sand/pebble was concentrated in the left ascending third of the channel. A thin layer of silt was present on much of the substratum, except in riffles. The substratum tended more towards a gravel/pebble/sand mix as the dam was approached. An island split the stream into two channels approximately 50 m upstream of the bridge, with the left channel having a substratum of cobble/pebble/sand and depth of less than 0.3 m, while the right channel had a bedrock/cobble/gravel substratum and depths less than 0.6 m (Beaty and Neves 1998).

STATUS OF THE PURPLE BEAN RANGEWIDE

Species Description - The purple bean is a small to medium-sized mussel that reaches a maximum length of approximately 55 millimeters. Its shell's outer surface is dark brown to black with numerous closely-spaced, fine green rays. The inside of the shell ranges from deep purple to whitish purple, or purple with a blush of salmon inside the pallial line. Valves of the males and females are sexually dimorphic (Simpson 1914). Male valves are straight or slightly concave on the ventral margin whereas valves of females are more ovate, slightly emarginate below the faint marsupial swelling. The purple bean is often confused with the Cumberland bean (*Villosa trabalis*), but the two can be differentiated by color of the interior shell (purple versus white) (Ahlstedt 1991).

Life History - The purple bean mussel is considered to be a long-term brooder. Long-term brooders typically spawn in late summer and become gravid in September, with glochidia larvae maturing in November. The purple bean requires a fish host for completion of its life cycle. The species releases its glochidia into the water column, where the larvae encyst on the gills of host fish. After a period of time, the larvae fall off the fish's gills and settle to the stream bottom, where they mature. The fish hosts of this species include the greenside darter (*Etheostoma blennioides*), fantail darter (*Etheostoma flabellare*), and the mottled sculpin (*Cottus bairdi*) and/or banded sculpin (*Cottus carolinae*) (Neves 1996). The purple bean is a riverine, riffle-dwelling benthic species that is restricted to headwater rivers and streams of the Upper Tennessee River system in Virginia and Tennessee. It is found in moderate to fast-flowing water in clean-swept sand, gravel, and cobble substrata, and under large flat rocks. It rarely occurs in pools or slack water areas but has been observed adjacent to water-willow beds (Ahlstedt 1984).

The purple bean is a filter feeder, taking algae, and other microorganisms from the water column. It requires clean water and a relatively silt-free substrate.

Status and Distribution - The purple bean was federally listed as endangered on January 10, 1997. It was found historically in the upper Tennessee River basin in Tennessee and Virginia. Presently, it survives in limited numbers at a few locations in the upper Clinch River basin in Scott, Tazewell, and Russell Counties, Virginia; Copper Creek, Scott County, Virginia (Gordon 1991); Indian Creek, Tazewell County, Virginia (Watson and Neves 1996); Obed River, Cumberland and Morgan Counties, Tennessee; Emory River, Morgan County, Tennessee; and Beech Creek, Hawkins County, Tennessee (Gordon 1991).

Threats to the Species - The purple bean populations in the lower Clinch, Powell, and Holston Rivers were extirpated by reservoirs. The decline of the species throughout the rest of its range was likely due to the adverse impacts of coal mining, non-point runoff, and point source pollution. The population centers that remain are so limited that they are vulnerable to events such as toxic chemical spills (U.S. Fish and Wildlife Service 1997). Other threats include logging, oil and gas exploration, removal of riparian shrub and tree vegetation, and improperly treated sewage (Ahlstedt 1991).

Non-point runoff and siltation from construction, agriculture, silviculture, roads, and removal of streambank vegetation is an important factor in the decline of many freshwater mussels, including the purple bean (U.S. Fish and Wildlife Service 1998). Sediment loads in waterways during periods of high discharge may be abrasive to mussel shells. This erosion of the outer shell may result in the corrosion of the underlying shell layers (U.S. Fish and Wildlife Service 1993a). Feeding mollusks will close their valves during periods of heavy siltation to avoid irritation and clogging of feeding structures (Loar et al. 1980). Excessive siltation can result in death from suffocation and interference with feeding (Ellis 1936). Land use changes may also affect the purple bean mussel. Removal of streambank vegetation affects the physical and biological processes of streams (U.S. Fish and Wildlife Service 1993a). Tree removal alters the amount of organic material and light reaching the stream, impacting both the temperature and dissolved oxygen, which are critical factors for both mussels and fish (U.S. Fish and Wildlife Service 1993a).

Recovery Goals and Accomplishments - The ultimate goal for recovery of the purple bean is to restore viable populations within a significant portion of their historical range, eliminate threats to its continued existence, and remove it from the Federal List of Endangered and Threatened Wildlife and Plants (U.S. Fish and Wildlife Service 1998).

Removing the purple bean from the federal endangered and threatened species list will be considered when the likelihood of their becoming extinct in the foreseeable future has been eliminated by achieving the following criteria (U.S. Fish and Wildlife Service 1998):

1. Through the protection of existing populations, reestablishment of historical populations, and/or discovery of currently unknown populations, there exists at least four distinct viable purple bean populations in the upper Tennessee River system.
2. Two distinct naturally reproduced year classes exist within each of the viable populations.
3. Studies of the mussel's biological and ecological requirements have been completed and recovery measures developed and implemented from these studies have been successful, as evidenced by an increase in population density and/or an increase in the length of the river reach inhabited in each of the viable populations.
4. No foreseeable threats exist that would likely threaten the survival of any of the viable populations.
5. The viable populations of the species are separated to the extent that it is unlikely that a single event would eliminate or significantly reduce more than one of the populations.

Several accomplishments to further identify the status and initiate recovery of the species have occurred

since the draft recovery plan for this species was published (U.S. Fish and Wildlife Service 1998). They are listed below:

- o 1999 - Augmentation of purple bean populations in Indian Creek, Tazewell County, Virginia and the Clinch River, Hancock County, Tennessee (Neves, R. pers. comm. 1999).
- o 1999 - Completion of an M.S. Thesis by Brian Watson of Virginia Polytechnic Institute and State University. Watson's thesis included a description of the mussel fauna of Indian Creek and their distribution. During his research, Watson identified several host fishes, collected demographic data on the purple bean population, and augmented it with juveniles from his host fish identification research (Neves, R. pers. comm. 1999).
- o Identification of the black sculpin (*Cottus baileyi*) as a host species of the purple bean. This discovery was made by VPI with funding from the Tennessee Wildlife Resources Agency (Neves, R. pers. comm. 1999).
- o 1999 (ongoing) - A series of public and interagency meetings have been held to discuss the degradation of Copper Creek and explore means by which to rehabilitate the waterway (Leroy Koch, U.S. Fish and Wildlife Service, pers.comm. 1999).
- o Ongoing research and production of mussels in the laboratory at Virginia Tech for eventual augmentation of existing purple bean populations and reintroduction of the species into suitable habitat (Neves pers. comm. 1999).
- o Evaluation by Virginia Tech of the effects of sedimentation on mussels and methods to augment or reintroduce populations (Neves pers. comm. 1999).

STATUS OF THE DUSKYTAIL DARTER RANGEWIDE

Species Description - *Etheostoma percnurum* is distinguished from the common fantail darter by narrower bars, a pectoral fin that is pigmented only distally, and a head often with large freckles. Adults measure 1-1 3/4 inches. In both sexes the back and side ground color is straw to brown olive or gray olive, sometimes with a pale yellow wash; saddles, bars, and top of head medium to dark olive; undersides are dingy white to pale gray. In nuptial males, irises are golden, and the anal fin is creamy white with a sharply contrasting black margin.

Life History - The duskytail darter occupies montane medium to large creeks and medium-sized rivers of the Tennessee and Cumberland River basins, that are of moderate gradient, warm, and usually clear. The species predominates in pools with gravel, rubble, and/or boulder bottoms; it is often found among

detritus and in slightly silted areas.

Most spawning occurs in May during a lengthy period of inversion under a stone. Eggs are laid in clusters in nest cavities and are protected by the male. The duskytail darter is a benthic invertivore. Smaller individuals feed mostly on crustaceans and midge larvae. Larger individuals consume midge, mayfly, and caddisfly larvae (Jenkins and Burkhead 1994).

Status and Distribution - The duskytail darter was listed as an endangered species on April 27, 1993 (U.S. Fish and Wildlife Service 1993c). The duskytail darter is endemic to the Tennessee and Cumberland River systems. Six relict populations are currently known: one in Copper Creek, Virginia, and five in Tennessee in Citico Creek, Abrams Creek, the Little River, South Fork Holston River, and the Big South Fork Cumberland River. The Copper Creek population extends from the mouth upstream for about 29 river kilometers (rkm) in this 98-rkm long stream. One duskytail was taken during 1980 in the Clinch River at Speers Ferry, 1 rkm below the mouth of Copper Creek. It is generally rare to uncommon in Copper Creek and rare in the Clinch River at Speers Ferry. It is extremely localized in those waterways in which it is found (Jenkins and Burkhead 1994).

Threats to the Species - Duskytail darter populations are threatened by the general deterioration of water quality resulting from siltation and other pollutants contributed by various land use practices, coal mining, and waste effluent discharges. Because the existing populations inhabit short river reaches, they are vulnerable to extirpation from accidental toxic chemical spills. Because of the duskytail darter's apparent microhabitat specificity and its relatively short life span, the species is extremely vulnerable to short-term and/or localized habitat alterations. In addition, as the populated stream reaches are isolated from each other by impoundments, recolonization of any extirpated population would not be possible without human intervention. The absence of natural gene flow among populations of these fishes leaves the long-term genetic viability of these isolated populations in question (U.S. Fish and Wildlife Service 1993c).

Recovery Goals and Accomplishments - The ultimate recovery goal of the duskytail darter is to restore viable populations to a significant portion of its historic range and remove the species from the Federal List of Endangered and Threatened Wildlife and Plants. The species can be considered for removal from ESA protection when the likelihood of the species becoming threatened again in the foreseeable future has been eliminated by the achievement of the following criteria:

1. Five distinct viable populations exist. Viable population is defined as a reproducing population that is large enough to maintain sufficient genetic variation to enable it to evolve and respond to natural habitat changes. The number of individuals needed and the amount and quality of habitat required to meet this criterion will be determined for the species as one of the recovery

tasks.

2. Studies of the fish's biological and ecological requirements have been completed and the implementation of management strategies developed from these studies has been successful.
3. No foreseeable threats exist that would likely threaten the survival of any of the populations (U.S. Fish and Wildlife Service 1993b).

Several accomplishments to further quantify the status and initiate recovery of the species have occurred since the recovery plan for this species was published (U.S. Fish and Wildlife Service 1993c). They are listed below:

- o Duskytail darter reintroduction has occurred in Abrams Creek, Blount County, Tennessee. Since reintroduction was initiated in 1989, duskytail darter reproduction in Abrams Creek has been documented (Baxter, J. pers. comm. 1999).
- o Ongoing riparian restoration of Abrams Creek by the National Park Service, Great Smoky Mountains National Park (Baxter, J. pers. comm. 1999).
- o Ongoing, periodic surveys for the duskytail darter in Copper Creek, Citico Creek, and the Powell River since 1982 (Baxter, J. pers. comm. 1999).
- o Series of public and interagency meetings have been held to discuss the degradation of Copper Creek and explore means by which to rehabilitate the waterway (Leroy Koch, U.S. Fish and Wildlife Service, personal communication, 1999).

Status of the Duskytail Darter Within the Action Area - The duskytail darter was not found during surveys conducted in the project action area during 1993 and 1998 (Baxter, J., pers. comm. 1999) (Jenkins, R., pers. comm. 1999), nor has the species been found in the action area historically. Also, due to the low habitat quality of the action area (Jenkins, R., pers. comm. 1999), the limited scope of this project, and the mobility of this species, the Service does not anticipate any adverse effect on the duskytail darter. Therefore, in the remainder of this document, the duskytail darter will only be discussed under the section entitled Conservation Recommendations.

STATUS OF THE YELLOWFIN MADTOM RANGEWIDE

Species Description - *N. flavipinnis* is a moderately elongated madtom with a maximum length of approximately 3.6 inches. It has a depressed head, large eyes, and a truncate to slightly rounded caudal fin. The pectoral spines are long with highly developed serrae. The fish's dorsal area is marked

with four prominent dorsal saddles, a dark bar is present on the caudal fin base and near the caudal margin, while the dorsal fin has a medial stripe. Live specimens exhibit a yellowish tinge on the paler areas of the body, particularly the fins.

Life History - Yellowfin madtoms almost exclusively eat immature forms of all major groups of benthic aquatic insects. The species feeds during day and night. Sexual maturity is usually attained in two years. Spawning occurs between about mid-May to mid-July. Eggs are deposited in cavities beneath flat rubble in pools usually less than 1 meter deep.

N. flavipinnis occupies typically clear, moderate-gradient, small streams to medium or large rivers of the Tennessee River basin. Two of the extant populations occur in warm water, usually pools and occasionally backwaters beside runs and riffles; slow runs are rarely occupied. During day and night this species generally lives near shore in slightly or moderately silted areas. Its cover includes sticks, logs, leaf litter, undercut banks, rocks, and trash (Jenkins 1975).

Status and Distribution - The yellowfin madtom was listed as a threatened species on September 9, 1977 (U.S. Fish and Wildlife Service 1977). Three populations are known to exist today. They are found in Copper Creek, Virginia and the Powell River and Citico Creek, Tennessee. The species was historically found in Chickamauga Creek, Georgia and Hines Creek, North Carolina. Critical habitat was designated on September 9, 1977, and consists of Copper Creek, from its confluence with Clinch River, upriver to Dickenson County, Virginia. Critical habitat for the yellowfin madtom has also been designated on the Powell River in Tennessee (Claiborne and Hancock Counties) and Virginia (Lee, Scott, and Russell Counties) (U.S. Fish and Wildlife Service 1977). The species has been reintroduced into Abrams Creek, Blount County, Tennessee. Spawning in Abrams Creek is suspected but has not been confirmed to date (Baxter, J., pers. comm. 1999). The species' distribution is highly localized in the Powell River and Citico Creek. In Copper Creek, in Scott and Russell Counties, Virginia, the species has been found widely in the lower 47 rkm, and has been collected at rkm 78. It has not been taken during sampling in rkm 57-75. It has been found between rkm 83-96. The yellowfin madtom is considered to be rare or uncommon in Copper Creek (Jenkins and Burkhead 1994). During a survey of Copper Creek in 1997/98 (Baxter, J., 1999 pers. comm.), it was not found in the action area, and was only found between stream km 2.7-2.8 and 22.3-24.8 (Baxter et al. 1999). During a survey of the project vicinity in 1993, Jenkins did not find the species (Jenkins, R. 1999 pers. comm.), however, it has been found in the action area historically and has been found both up- and downstream of the action area in recent years.

Threats to the Species - The habitat of *N. Flavipinnis* is degraded by siltation, agricultural pollution, and impoundments (Terwilliger 1991). Sources of siltation can include exposed/eroding streambanks, loss of riparian vegetation, and agricultural and construction-related erosion. Because the existing populations inhabit short river reaches, they are vulnerable to extirpation from accidental toxic chemical spills.

Recovery Goals and Accomplishments - The recovery goal for the yellowfin madtom is to restore viable populations to a significant portion of its historic range. It will be considered recovered when the following criteria are met:

1. Through protection of existing populations and/or by introductions and/or discoveries of new populations, there exist viable populations of the following magnitude in the Powell River, Copper Creek, and Citico Creek:
 - a. a minimum of five population centers in the Powell River, Tennessee,
 - b. a wide distribution of the species in Copper Creek, Virginia from the creek's mouth to rkm 50,
 - c. a wide distribution in Citico Creek, Tennessee throughout its preferred habitat.
2. Through introductions and/or discoveries of new populations, there exists viable populations in two other rivers within the species historic range. These populations should be at least as large as the smallest population in the aforementioned rivers.
3. Noticeable improvements in coal-related problems and substrate quality have occurred in the Powell River.
4. The species and its habitat in all five waterways (Copper Creek, N/F Holston River, Powell River, Hines Creek, and Chickamauga Creek) are protected from present and foreseeable human related and natural threats that may adversely affect essential habitat or the survival of any of the populations.

Several accomplishments to further identify the status and initiate recovery of the species have occurred since the recovery plan for this species was published (U.S. Fish and Wildlife Service 1983). They are listed below:

- o 1997-1998 - survey of yellowfin madtom in Copper Creek, Scott and Russell Counties, Virginia (Baxter, J. et al. 1999).
- o 1998/99 successful egg hatching and propagation of the yellowfin madtom in captivity (Baxter, J. 1999 pers. comm.).
- o yellowfin madtom reintroduction into Abrams Creek, Blount County, Tennessee since 1989 (Baxter, J. 1999 pers. comm.).

- o ongoing riparian restoration of Abrams Creek by the National Park Service, Great Smoky Mountains National Park (Baxter, J. 1999 pers. comm.).
- o ongoing, periodic surveys for the yellowfin madtom in Copper Creek, Citico Creek, and the Powell River since 1982 (Baxter, J. 1999 pers. comm.).
- o a series of public and interagency meetings have been held to discuss the degradation of Copper Creek and explore means by which to rehabilitate the waterway (Leroy Koch, U.S. Fish and Wildlife Service, 1999 pers. comm.).
- o 1981-1984 research by Gerald Dinkins and Peggy Shute on the life history and survey of the yellowfin madtom in Citico Creek (Baxter, J., 1999 pers. comm.).

ENVIRONMENTAL BASELINE

Status of the Purple Bean Within the Action Area - A mussel survey of the action area was conducted by representatives of the Virginia Cooperative Fish and Wildlife Research Unit of Virginia Tech on June 3, 1998. During this survey, two live specimens of the purple bean were found approximately 80 meters and 170 meters downstream of the Route 665 bridge. Two shells of the purple bean were also found in the action area. Survey procedures and sampling consisted of snorkeling the stream within the designated reach to collect and identify all live mussels and valves. Additionally, stream banks and margins were checked for muskrat middens and miscellaneous shells. The survey consisted of approximately 27 man-hours.

Status of the Yellowfin Madtom Within the Action Area - Copper Creek, from its confluence with Clinch River, upriver to Dickenson County, Virginia, has been designated as critical habitat for the yellowfin madtom. In Copper Creek, the yellowfin madtom has been found widely in the lower 47 rkm, and has been collected at rkm 78. It has not been taken during sampling in rkm 57-75. It has been found between rkm 83-96. The yellowfin madtom is considered to be rare or uncommon in Copper Creek (Jenkins and Burkhead 1994). During a survey of Copper Creek in 1997/98 (Baxter, J. 1999 pers. comm.), it was not found in the action area (rkm 12.3), and was only found between km 2.7-2.8 and 22.3-24.8 (Baxter et al. 1999). During a survey of the project vicinity in 1993, Jenkins did not find the species (Jenkins, R. 1999 pers. comm.). However, the yellowfin madtom has been found in the project action area since 1969 (Wilcox, T., Virginia Department of Game and Inland Fisheries, pers. comm., 1999).

EFFECTS OF THE ACTION

Direct Effects - In evaluating the effects of the Federal action under consideration in this consultation, 50 CFR 402.2 and 402.14(g)(3) requires the Service to evaluate the direct and indirect effects of the action on the species. Direct impacts to the purple bean and yellowfin madtom include the potential to

kill and/or injure a small number of individuals during construction through the use of heavy equipment, construction materials, and human traffic in Copper Creek. Mussels inhabit the streambed and are not mobile, and thus may be crushed by the placement of the cofferdam, concrete, or rock-filled timber crib, during removal of the old bridge, and excavation of the streambed for the new bridge pier. The purple bean and madtom may also be killed or stressed due to siltation in Copper Creek from construction activities. Heavy siltation can result in the impairment of feeding, spawning, and larval survival of both species. Heavy siltation can also result in reduced oxygen levels, which can adversely impact metabolic processes. Direct effects are anticipated to occur within the action area from 100 meters upstream to 800 meters downstream of the existing bridge.

Approximately 1100 square feet of critical habitat for the yellowfin madtom will be impacted by the project. Approximately 260 square feet of stream bottom will be permanently filled by the construction of the new bridge pier, but this loss of habitat will be mitigated by the removal of the old pier. Approximately 750 square feet of streambed will be temporarily filled during emplacement of the temporary work bridge and cofferdams. This material will be removed and the streambed restored at the completion of the project. Siltation during construction may temporarily reduce habitat suitability for spawning and feeding. These impacts are minor and/or of short term duration. Therefore, no destruction or adverse modification of critical habitat for the yellowfin madtom is anticipated.

Indirect Effects - Indirect effects are defined as those that are caused by the proposed action and are later in time, but still are reasonably certain to occur (50 CFR 402.02). Indirect effects to the purple bean and yellowfin madtom may result from continuing erosion of the construction site after project completion during rain events, if the site is not adequately stabilized and revegetated. Indirect effects to the purple bean may also occur if its host fish are adversely affected by siltation. Any loss of host fish could result in a lower recruitment of larval mussels in the year following the construction period. Such a loss of recruitment would be expected to be extremely low.

Interrelated and Interdependent Actions - An interrelated activity is an activity that is part of the proposed action and depends on the proposed action for its justification. An interdependent activity is an activity that has no independent utility apart from the action under consultation. The Service is not aware of any such actions.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, local, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to Section 7 of the Endangered Species Act. Cumulative effects likely to impact these species include ongoing siltation from upland activities and non-point source pollution inputs into Copper Creek from the bridge and roadway and surrounding upland development. Spills of toxic materials into Copper Creek from accidents on the bridge and roadway are also possible. These

ongoing activities have the potential to result in the chronic deterioration of water quality and habitat for the purple bean and yellowfin madtom. Continued habitat degradation could result in the eventual loss of these species in the action area and downstream.

CONCLUSION

After reviewing the current status of the purple bean and yellowfin madtom throughout their ranges and in the action area, the environmental baseline for the action area, the effects of the proposed action and the cumulative effects, it is the Service's biological opinion that the action, as proposed, is not likely to jeopardize the continued existence of the purple bean or yellowfin madtom, nor result in the destruction or adverse modification of critical habitat for the yellowfin madtom.

III. INCIDENTAL TAKE STATEMENT

Sections 9 of the ESA and federal regulation pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without a special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns such as breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns, which include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the ESA provided that such taking is in compliance with the terms and conditions of this incidental take statement.

The measures described below are nondiscretionary, and must be undertaken by the Corps and VDOT so that they become binding conditions of any permit issued to the applicant for the exemption in action 7(o)(2) to apply. The Corps of Engineers has a continuing duty to regulate the activity covered by this incidental take statement. If the Corps (1) fails to assume and implement the terms and conditions or (2) fails to require the applicant to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. To monitor the impact of incidental take, VDOT must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement.

AMOUNT OR EXTENT OF TAKE

The Service anticipates that incidental take of the purple bean and yellowfin madtom may occur during

construction in the form of harm of an unknown but small number of individuals due to physical disturbance, siltation, and other water quality degradation, in that portion of Copper Creek from 100 meters upstream of the existing Route 665 bridge to 800 meters downstream of the existing bridge. Approximately 250 and 750 square feet of critical habitat will be permanently or temporarily impacted by this project, respectively.

REASONABLE AND PRUDENT MEASURES

The Service believes that the following reasonable and prudent measures are necessary and appropriate to minimize take:

- o Instream construction must be conducted during the time of year when impacts to the purple bean, and the yellowfin madtom reproductive cycle and the host fish of the purple bean are minimized. Instream construction must be avoided

during
Februa
ry
through
mid-
July
and
mid-
August
through
Septem
ber
when
the
purple
bean is
spawni
ng and
releasin
g
glochidi
a and
when
the
yellowfi
n
madto
m is
spawni
ng.
Aavoida
nce of
constru
ction
during
these
times
will
also
protect
three of

the
known
host
fish of
the
purple
bean
(*Ethost
oma
flabell
are, E.
blennio
ides,
and
Cottus
bairdi*)
during
spawni
ng.

- o Siltation of the water column of Copper Creek must be minimized to avoid stress or death of the purple bean and yellowfin madtom, and siltation of critical habitat for the yellowfin madtom.
- o Construction activities within Copper Creek must be minimized to avoid siltation and physical injury to the purple bean and yellowfin madtom. No machinery will be allowed in the river and human traffic in the river must be minimized and confined to the area of the existing bridge.

TERMS AND CONDITIONS

In order to be exempt from the prohibitions of Section 9 of the Endangered Species Act, the Corps and VDOT must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline the required reporting/monitoring requirements. Monitoring is not required for this project because only a small number of the purple bean and yellowfin madtom are likely to be affected by the proposed project and the anticipated take is minimal. These terms and conditions are nondiscretionary.

1. No instream work will be conducted during the time period of February 1 through July 15 and August 15 through September 30 of any year.

2. Within one month prior to the initiation of construction, VDOT must perform a mussel survey of the action area. Any purple bean mussels found during this survey must be relocated to suitable habitat in Copper Creek, outside of the action area. Attached is a list of individuals who are qualified to conduct surveys and mussel translocations. If the individuals on this list are not available, contact this office. To ensure that an adequate survey and translocation are conducted, the names and proposed designs must be submitted to the Service for approval, before any work is conducted. Results of the survey and translocation must be submitted to the Service no later than 60 days following completion. The report must include name of surveyors, dates of surveys, methods, results, and the number and location of mussels moved. The Service shall also be provided a U.S.G.S. topographic map with locations of any mussels found and where they were translocated.
3. All water removed from Copper Creek from cofferdams, etc., must be pumped into filter bags constructed of non-woven geotextile fabric that are placed on uplands as far away from Copper Creek as practical.
4. No mechanized equipment will be allowed in Copper Creek or its adjacent waters. Any equipment operated from the northern shoreline will operate from a rock construction pad or be placed on a mat to reduce sedimentation into Copper Creek.
5. Vegetation removal adjacent to the streambank will be minimized. Trees will be felled on land rather than into the waters of Copper Creek.
6. Human traffic within the river during construction will be minimized.
7. All portions of the existing bridge will be removed from its existing location and will not be allowed to enter the river after removal from the bridge. All debris will be contained and removed from the site.
8. Erosion and sediment controls will be strictly adhered to in accordance with the Virginia Erosion and Sediment Control Handbook. All floodplain fill must be removed from the construction area immediately upon the termination of construction. All exposed soils will be stabilized and seeded immediately following disturbance. Initial stabilization may be with annual rye or orchard grass; permanent vegetation shall be with native species.
9. To stabilize streambanks and maintain overall habitat quality for the purple bean and yellowfin madtom, native trees must be planted on the northern streambank adjacent to the action area, where trees are not already present. Concurrent with the initiation of project construction, VDOT must plant at least two species of native riparian trees in a 50 foot wide section from 100 meters upstream of the existing bridge to 800 meters downstream of the existing Route

665 bridge over Copper Creek. Trees must be planted on 10 foot centers with a minimum of 50% survival the first year. If tree survival is less than 50%, VDOT must replace all dead trees within 18 months after planting.

10. The applicant is required to notify the Service at least 10 days before initiation of construction and upon completion of the project at the address given below. All additional information to be sent to the Service should be sent to the following address:

Virginia Field Office
U.S. Fish and Wildlife Service
6669 Short Lane
Gloucester, VA 23061
Phone (804) 693-6694
Fax (804) 693-9032

11. Care must be taken in handling any dead specimens of proposed or listed species that are found in the project area to preserve biological material in the best possible state. In conjunction with the preservation of any dead specimens, the finder has the responsibility to ensure that evidence intrinsic to determining the cause of death of the specimen is not unnecessarily disturbed. The finding of dead specimens does not imply enforcement proceedings pursuant to the ESA. The reporting of dead specimens is required to enable the Service to determine if take is reached or exceeded and to ensure that the terms and conditions are appropriate and effective. Upon locating a dead specimen, notify the Service at the address provided.

The Service believes that a small but unquantified number of individuals of the purple bean and yellowfin madtom within an area of 204,000 square feet will be incidentally taken as a result of the proposed action. The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed action. If, during the course of the action, this level of incidental take is exceeded, such incidental take represents new information requiring reinitiation of consultation and review of the reasonable and prudent measures. The Corps must immediately provide an explanation of the causes of the take, and review with the Service the need for possible modification of the reasonable and prudent measures and the terms and conditions.

IV. CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the ESA directs federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to further minimize or avoid adverse

effects of a proposed action on listed species or critical habitat, to help implement recovery plans and other recovery activities, or to develop information to benefit the species.

The project vicinity is rural and the riparian corridor of Copper Creek is largely composed of wooded tracts and numerous agricultural fields. Many agricultural fields in the Copper Creek drainage are located within close proximity (i.e. 100 feet or less) to Copper Creek. Runoff from these agricultural fields may contain relatively high levels of nutrients and suspended solids.

Vegetated riparian buffers can be effective at reducing non-point runoff before it enters Copper Creek. Riparian buffers can improve water quality for the purple bean and help improve critical habitat for the yellowfin madtom.

The Service recommends that VDOT provide funding for establishment of a 100'-wide, wooded riparian corridor on the northern shoreline of Copper Creek within the action area. Various federal and state agencies, as well as private consulting firms, could perform riparian restoration in this area if funding were made available. Please contact this office if we can provide further assistance with such an initiative.

In order for the Service to be kept informed of actions that minimize or avoid adverse effects or benefit listed species or their habitats, the Service requests notification of the implementation of any of these conservation recommendations by the Corps and/or VDOT.

V. REINITIATION NOTICE

This concludes formal consultation on the action outlined in the Corps request letter dated April 13, 1999. As provided in 50 CFR 402.16, reinitiation of formal consultation is required where discretionary federal agency involvement or control over the action has been retained and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease, pending reinitiation.

The Service appreciates the opportunity to work with the Corps in fulfilling our mutual responsibilities under the Endangered Species Act. Please contact William Hester of this office at (804) 693-6694, ext. 134 if you require additional information or wish to discuss our comments further.

Sincerely,

Karen L. Mayne

Supervisor
Virginia Field Office

cc: Bill Beuter, VDOT Headquarters, Richmond, VA
Dennis Sanders, VDOT, Bristol District Office

TENNESSEE RIVER DRAINAGE FRESHWATER MUSSEL
SURVEY CONTACTS

Dr. Richard Neves
Department of Fish and Wildlife
Virginia Tech
Blacksburg, VA 24061-0321
(540) 231-5927

Virginia Dept. of Game and Inland Fisheries
2206 S. Main Street
Blacksburg, VA 24060
(540) 552-6992

Dr. Tom Watters
Aquatic Ecology Lab
Ohio State University
1314 Kinnear Road
Columbus, OH 43212
(614) 292-6170

Dr. Arthur Bogan
N.C. State Museum of Natural Sciences
Raleigh, NC 27626
(919) 715-2606

Catherine M. Gatenby
Department of Biology
Virginia Tech
Blacksburg, VA 24061
(540) 231-5508
e-mail: cgatenby@vt.edu

Braven Beaty
151 W. Main St.
Abingdon, VA 24210
(540) 676-2209

Arthur Clarke
Ecosearch, Inc.
325 E. Bayview
Portland, TX 78374
(512) 643-6613

Douglas Shelton
Malacological Research Center
2370-G Hillcrest Rd. #236
Mobile, AL 36695
(334) 639-0480

Inclusion of names on this list does not constitute endorsement by the U.S Fish and Wildlife Service or any other U.S. Government agency.